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DEPARTMENT OF TRANSPORTATION

CHADBOURN

THOROUGHFARE PLAN

1980

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH 27611

JAMES B. HUNT, JR.
GOVERNOR

THOMAS W. BRADSHAW, JR.
SECRETARY

DIVISION OF HIGHWAYS

June 17, 1980

The Honorable Leo Mercer
Mayor of the Town of Chadbourn
P. O. Box 368
Chadbourn, N. C. 28431

Dear Mayor Mercer:

We are pleased to submit herewith the report, Chadbourn Thoroughfare Plan, giving a description of the plan and describing the inventory, analysis, and other supporting data. This plan was developed as a guide for solving the existing and anticipated traffic problems in the Chadbourn area. The basis for this plan was a series of traffic, population, and land use studies of the area.

It is emphasized that the proposed plan is a balanced network, and the effectiveness of any portion of the plan is largely dependent upon the eventual development of the entire plan. A high degree of cooperation and coordination should prevail as this plan is implemented.

Cordially yours,

Billy Rose
State Highway Administrator

BR/dk

CHADBOURN THOROUGHFARE PLAN

Prepared by:

Planning and Research Branch,
Division of Highways, North Carolina
Department of Transportation

In cooperation with:

The Town of Chadbourn
The Federal Highway Administration of the
United States Department of Transportation

June, 1980

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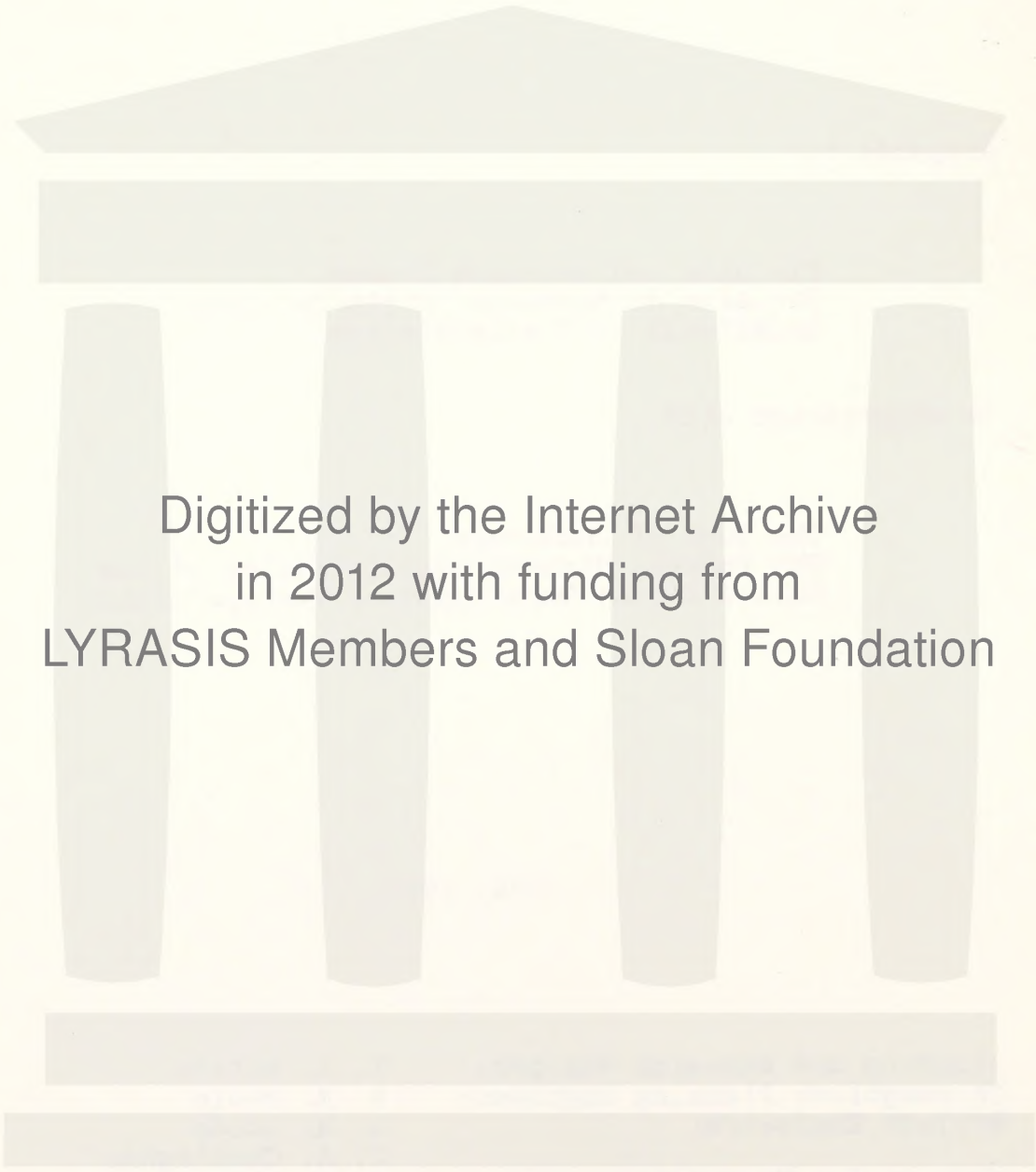

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I. INTRODUCTION

The Town of Chadbourn officially adopted a thoroughfare plan on June 20, 1966. The North Carolina State Highway Commission (now the North Carolina Board of Transportation) followed by approving and adopting the plan on July 15, 1966. Since the changing patterns of growth within an area necessitates that the transportation planning process be continuous, this report updates the adopted thoroughfare plan.

The principles of basic thoroughfare planning, as described in Chapter II, were used to develop this thoroughfare plan. It is based on very general traffic, population, and land use data. Trend line projections of traffic were used to determine capacity deficiencies. Major and minor thoroughfares were located based on field investigations, existing and anticipated land uses, and topographic conditions. The revised thoroughfare plan is expected to meet traffic demands in Chadbourn for the planning period (1980-2000).

The N. C. Board of Transportation and the Town of Chadbourn will jointly be responsible for the proposed revised thoroughfare improvements. Cooperation between the two governmental units is a primary concern. In order to insure coordination of efforts, it is desirable that the thoroughfare plan be formally adopted by the local governing body and the Board of Transportation as provided for in Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina.

It should be emphasized that the recommended plan is based on anticipated growth of the urban area as currently perceived. Prior to construction of specific projects, a more detailed study will be required to reconsider development trends and to determine specific locations and design requirements.

II. THOROUGHFARE PLANNING PRINCIPLES

Typically, the urban street system occupies 25 to 30 percent of the total developed land in an urban area. Since the system is permanent and expensive to build and maintain, much care and foresight are needed in its development. Thoroughfare planning is the process used by public officials to assure the development of the most appropriate street system to meet existing and future travel desires within the urban area.

The primary aim of a thoroughfare plan is to guide the development of the urban street system in a manner consistent with changing traffic demands. Through proper planning for street development, many costly errors and much needless expense can be averted. A thoroughfare plan will enable street improvements to be made as traffic demands increase, and only such improvements necessary to meet these demands need be made. By developing the urban street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained, thereby requiring a minimum amount of land for street purposes. In addition to providing for traffic needs, the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial, and industrial enterprises, affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

(1) To provide for the orderly development of an adequate major street system as land development occurs;

(2) To reduce travel and transportation costs;

(3) To reduce the cost of major street improvements to the public through the coordination of the street system with private action;

(4) To enable private interests to plan their actions, improvements, and development with full knowledge of public intent;

(5) To minimize disruption and displacement of people and businesses through long range advance planning for major street improvements;

(6) To reduce environmental impacts such as air pollution, resulting from transportation;

(7) To increase travel safety.

Thoroughfare planning objectives are achieved through both: (1) improving the operational efficiency of thoroughfares; and (2) improving the system efficiency through system coordination and layout.

Operational Efficiency

A street's operational efficiency is improved by increasing the capability of the street to carry vehicular traffic and people. In terms of vehicular traffic, a street's capacity is defined as the maximum number of vehicles which can pass a given point on a roadway during a given time period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic and weather.

Physical ways to improve vehicular capacity include street widening, intersection improvements, improving vertical and horizontal alignment, and eliminating roadside obstacles. For example, widening of a street from two to four travel lanes more than doubles the capacity of the street by providing additional maneuverability for traffic. Impedances to traffic flow caused by slow moving or turning vehicles and adverse effects of horizontal and vertical alignments are thus reduced.

Operational ways to improve street capacity include:

(1) Control of access - A roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number.

(2) Parking removal - Increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking and unparking vehicles.

(3) One-way operation - The capacity of a street can sometimes be increased 20-50%, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.

(4) Reversible lanes - Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.

(5) Signal phasing and coordination - Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

(1) Encourage people to form carpools and vanpools for journeys to work and other trip purposes. This reduces the number of vehicles on the roadway and raises the people carrying capability of the street system.

(2) Encourage the use of transit and the bicycle mode.

(3) Encourage industries, business, and institutions to stagger work hours or establish variable work hours for employees. This will reduce travel demand in peak periods and spread peak travel over a longer time period.

(4) Plan and encourage land use development or redevelopment in a more travel efficient manner.

System Efficiency

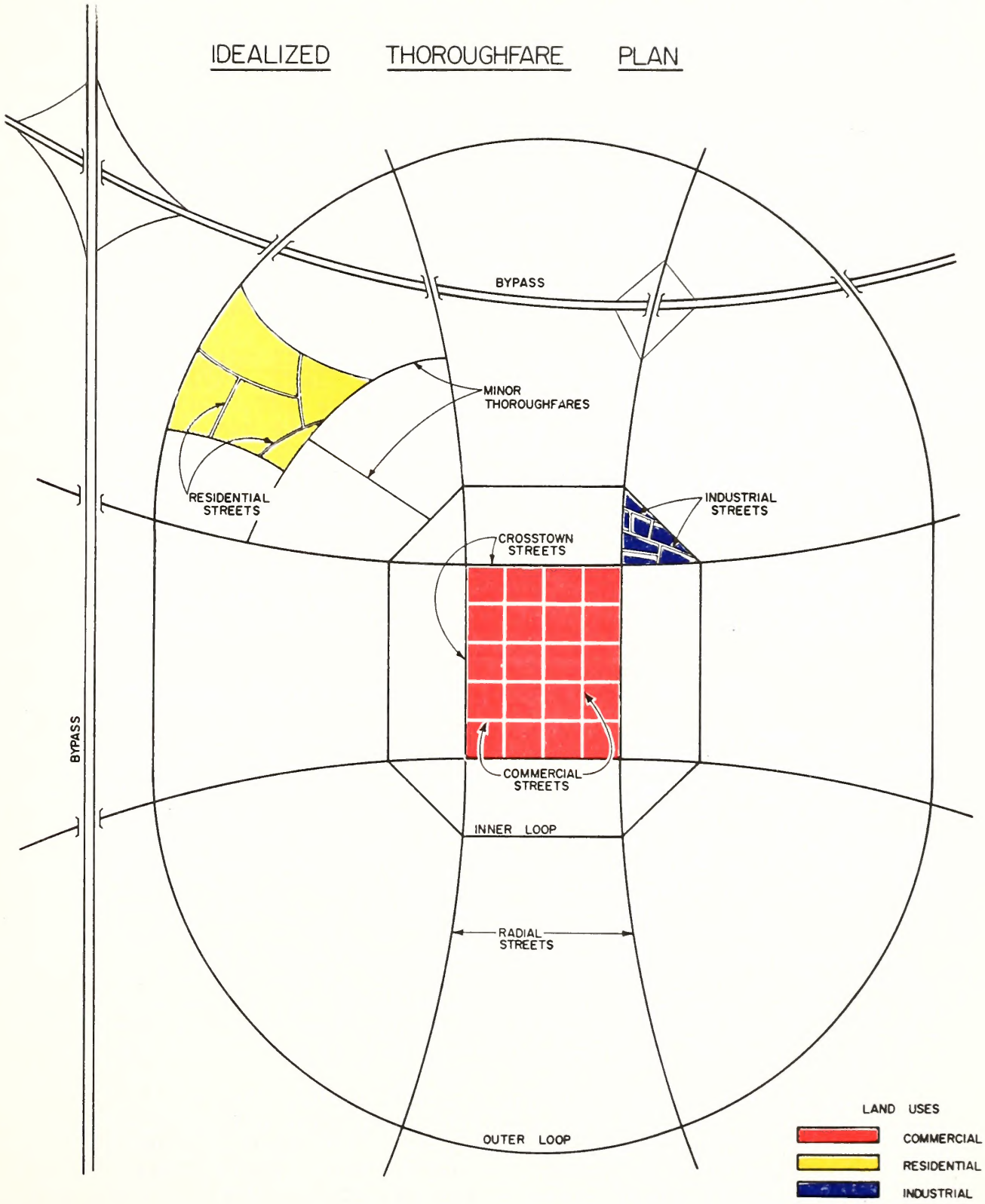
Another means for altering travel demand is the development of a more efficient system of streets that will better serve travel desires. A more efficient system can reduce travel distances, time, and cost. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

Functional Classification

Streets perform two primary functions--traffic service and land service, which when combined, are basically incompatible. The conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property lead to intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets which permits travel from origins to destinations with directness, ease, and safety. Different streets in the system are designed and called on to perform specific functions, thus minimizing the traffic and land service conflict. Streets are categorized as to function as local access streets, minor thoroughfares, or major thoroughfares (see Figure 1).

FIGURE 1


IDEALIZED THOROUGHFARE PLAN
BYPASS
MINOR THOROUGHFARES
RESIDENTIAL STREETS
INDUSTRIAL STREETS
CROSSTOWN STREETS
COMMERCIAL STREETS
INNER LOOP
RADIAL STREETS
OUTER LOOP
BYPASS
LAND USES
COMMERCIAL
RESIDENTIAL
INDUSTRIAL

Local Access Streets provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located such that only traffic with origins and destinations on the streets would be served. Local streets may be further classified as either residential, commercial, and/or industrial depending upon the type of land use which they serve.

Minor Thoroughfares are more important streets in the city system. They collect traffic from local access streets and carry it to the major thoroughfare system. They may in some instances supplement the major thoroughfare system by facilitating minor through traffic movements. A third function which may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

Major Thoroughfares are the primary traffic arteries of the city. Their function is to move intra-city and inter-city traffic. The streets which comprise the major thoroughfare system may also serve abutting property; however, THEIR MAJOR FUNCTION IS TO CARRY TRAFFIC. They should not be bordered by uncontrolled strip development because such development significantly lowers the capacity of the thoroughfare to carry traffic and each driveway is a danger and an impediment to traffic flow. Major thoroughfares may range from a two-lane street carrying minor traffic volumes to major expressways with four or more traffic lanes. Parking normally should not be permitted on major thoroughfares.

Idealized Major Thoroughfare System

A coordinated system of major thoroughfares forms the basic framework of the urban street system. A major thoroughfare system which is most adaptable to desire lines of travel within an urban area and which permits movement between various areas of the city with maximum directness is the radial-loop system. This system consists of several functional elements-radial streets, crosstown streets, loop system streets, and bypasses (Figure 1, p. 5).

Radial streets provide for traffic movement between points located in the outskirts of the city and the central area. This is a major traffic movement in most cities, and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of crosstown streets which form a loop around the central business district. This system allows traffic moving from origins on

one side of the central area to destinations on the other to follow the area's border and allows central area traffic to circle and then enter the area near a given destination. The effect of a good crosstown system is to free the central area of crosstown traffic, thus permitting the central area to function more adequately in its role as a pedestrian shopping area.

Loop system streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central areas. There may be one or more loops, depending on the size of the urban area, and they are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

A bypass is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing from it traffic which has no desire to be in the city. Bypasses are usually designed to through highway standards, with control of access. Occasionally a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of operational efficiency, system efficiency, functional classification, and idealized major thoroughfare system are the conceptional tools available to the transportation planner in developing a thoroughfare plan. In actual practice, thoroughfare planning is done for established urban areas and is constrained by existing land use and streets, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these and the many other factors that affect major street locations.

Throughout the thoroughfare planning process it is necessary from a practical viewpoint that certain basic principles be followed as closely as possible. These principles are:

(1) The plan should be derived from a thorough knowledge of today's travel - its component parts, as well as the factors that contribute to it, limit it, and modify it.

(2) Traffic demands must be sufficient to warrant the designation and development of each major street. The thoroughfare plan should be designed to accommodate a large portion of all major traffic movements on a relatively few streets.

(3) The plan should conform to and encourage the land development plan of the area.

(4) Certain considerations must be given to urban development beyond the current planning period. Particularly in outlying or sparsely developed areas which have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect rights-of-way for future thoroughfare development.

(5) While being consistent with the above principles and realistic in terms of travel trends, the plan must be economically feasible.

III. POPULATION, LAND USE AND TRAFFIC

The Town of Chadbourn lies in the southeastern part of the state in Columbus County. It is located seven miles west of Whiteville, the county seat and 15 miles north of the South Carolina border. (see Figure 2).

Population Trends

The planning area for this study includes the Town of Chadbourn and the area within the one mile perimeter around the corporate limits. The 1978 estimated population of Chadbourn is 2,390.

Although the growth of Chadbourn has been virtually stagnant since 1950, the town expected to experience moderate growth during the planning period due to industrial development south of town.

TABLE 1

POPULATION TRENDS FOR CHADBOURN

	1950	1960	1970	1978	1980	1990	2000
Columbus Co.	50,621	48,973	46,937	51,600	52,600	57,860	63,650
Chadbourn Townnship	5,083	6,019	5,460	5,870	5,972*	6,154*	6,322*
Chadbourn	2,013	2,323	2,213	2,390	2,430*	2,668*	2,930*

*Source: Land Use Plan, Chadbourn, N. C., N. C. Department of Natural and Economic Resources.

Land Use Trends

Land use is an important aspect in traffic generation. A general knowledge of land use is essential in understanding traffic patterns and desires. Land use data is taken from Land Use Plan, Chadbourn, N. C. prepared by the N. C. Department of Natural & Economic Resources.

Commercial land use is concentrated in three sections of the planning area: the Central Business District (CBD), north of the CBD along Brown Street (NC 410), and Strawberry Boulevard. The CBD is in a deteriorating condition and new commercial development is likely to occur along Strawberry Boulevard or along North Brown Street.

Industry is located along the Seaboard Coastline Railroad within the city. There are also a few warehouses at other locations. A new aluminum smelting plant is proposed to locate

GEOGRAPHIC LOCATION

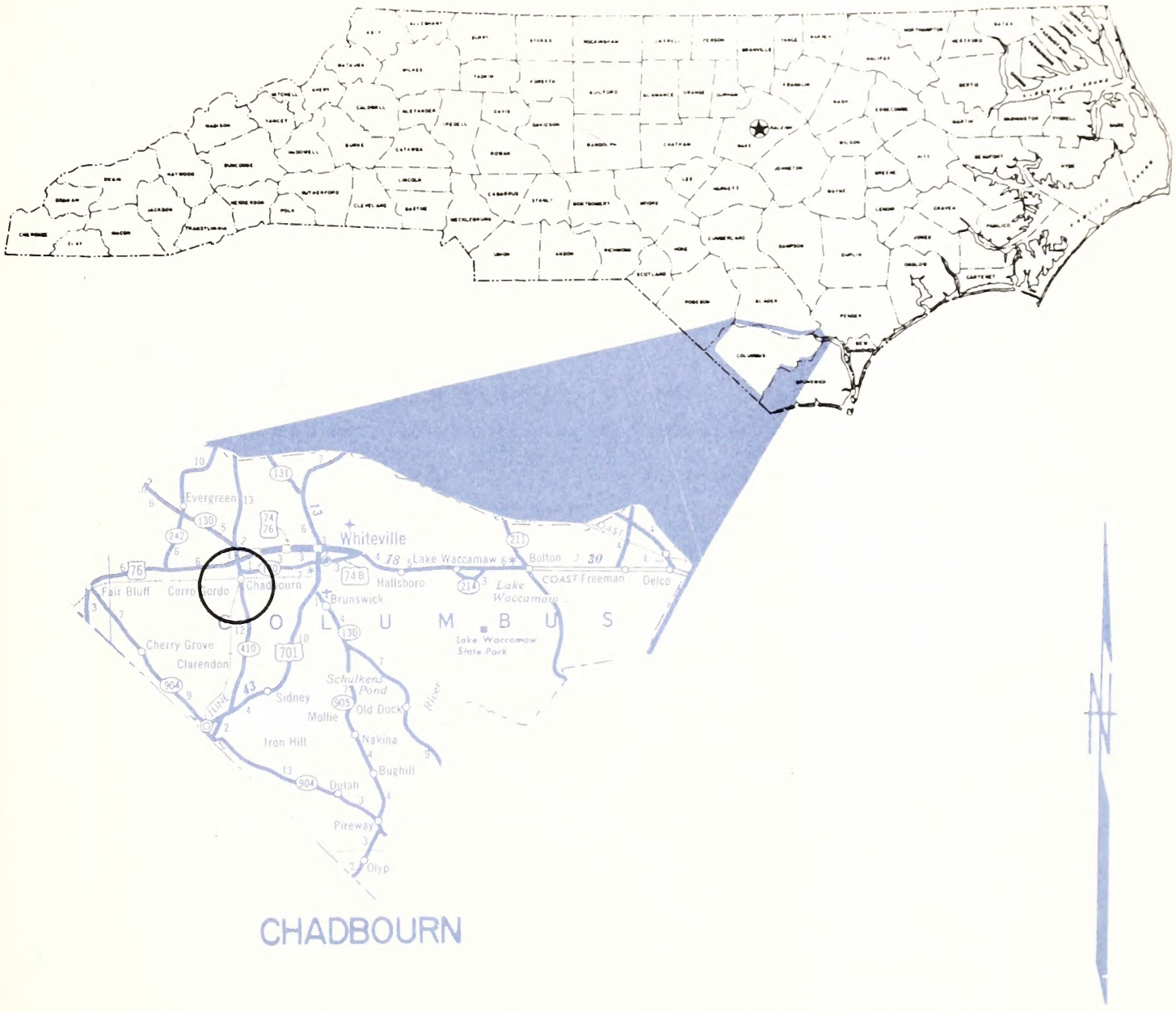
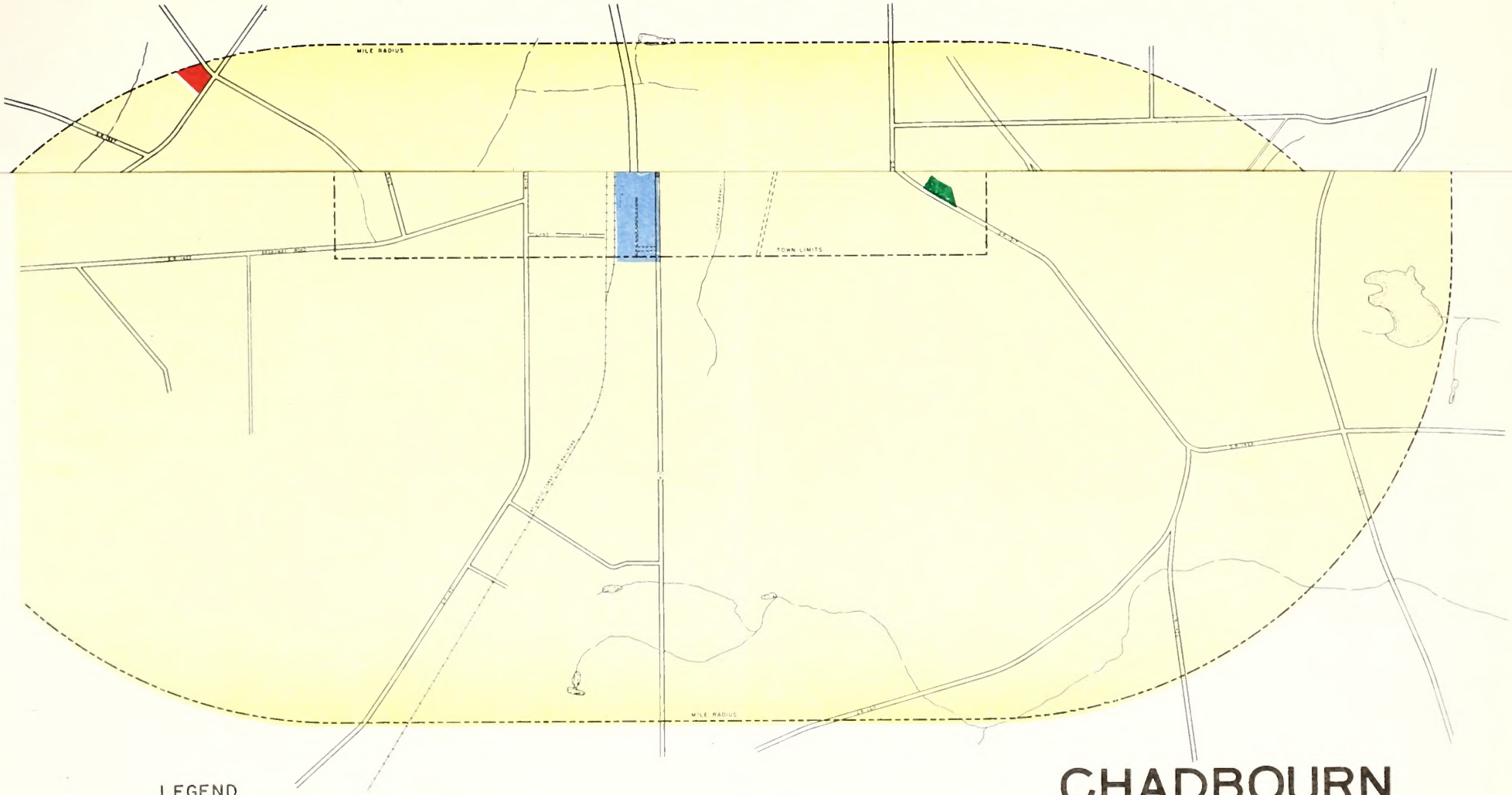


FIGURE 2



LEGEND

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- SOCIAL & CULTURE

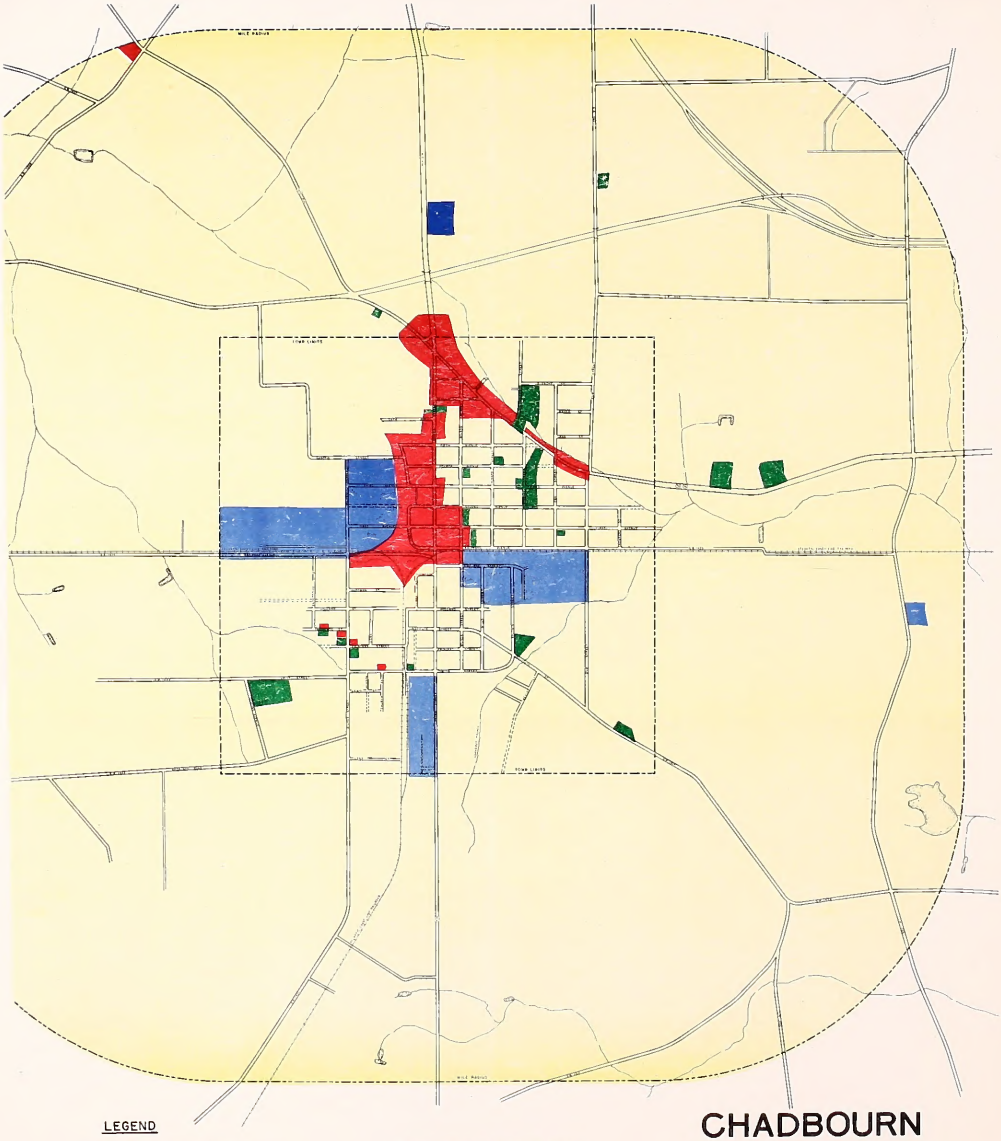
FUTURE LAND USE

CHADBOURN

NORTH CAROLINA

The preparation of this map was financed in part through an urban planning grant from the Housing and Home Finance Agency under the provisions of Section 701 of the Housing Act of 1954 as amended

THIS MAP WAS PREPARED FOR THE TOWN OF CHADBOURN BY THE DEPARTMENT OF CONSERVATION AND DEVELOPMENT DIVISION OF COMMUNITY PLANNING



FUTURE LAND USE

CHADBOURN

NORTH CAROLINA

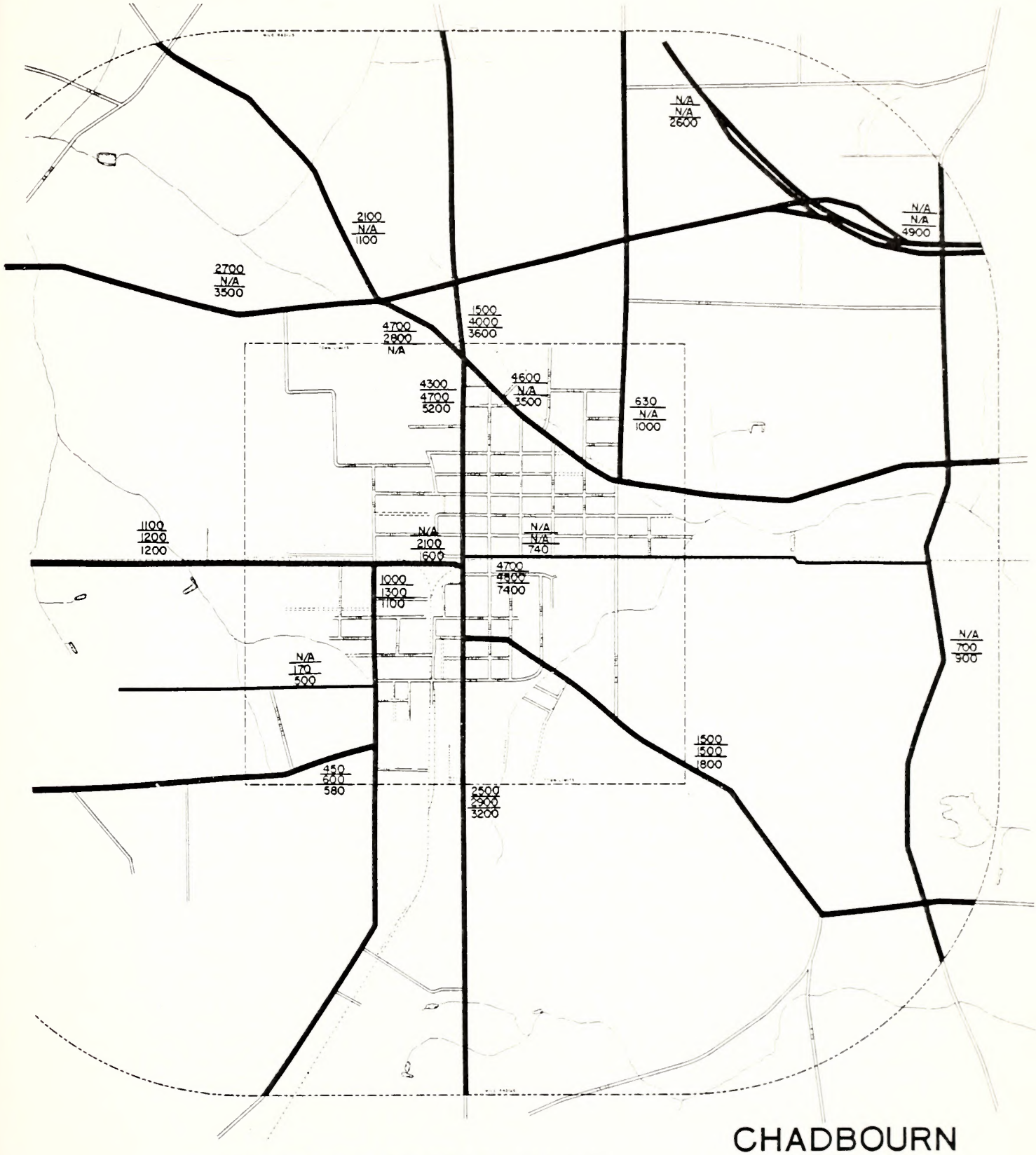
south of the city between NC 410 and the railroad. Allied industries are expected to locate nearby, but probably not within the Chadbourn Planning Area.

Social and cultural land uses in the Chadbourn Planning Area include schools, churches, cemeteries, a park, atheletic fields and various institutional uses. These are scattered throughout the planning area.

There has been very little change in residential land use in Chadbourn since 1966. The largest residential area is located north of Railroad Avenue and east of Wilson Street. This is also where the greatest amount of residential development has occurred. Other residential areas are the section South of Railroad Avenue and west of the Seaboard Coastline Railroad, the section south of Kirkland Street and east of the Seaboard Coastline Railroad, and the section west of Wilson Street and north of the Seaboard Coastline. In the fringe area, residential development is scattered along the major traffic arteries.

Traffic Volume Trends

Figure 4 shows the 1969, 1974, and 1979 average daily traffic (ADT) in vehicles per day for Chadbourn's street system. A significant increase in traffic is expected to occur in Chadbourn due to the industrial development south of town. Volumes along NC 410 are expected to increase significantly.



CHADBOURN

NORTH CAROLINA

TRAFFIC ON EXISTING MAJOR STREET SYSTEM

FIGURE 4

IV. EXISTING STREETS, DEFICIENCIES, AND THOROUGHFARE PLAN

Existing Major Streets and Deficiencies

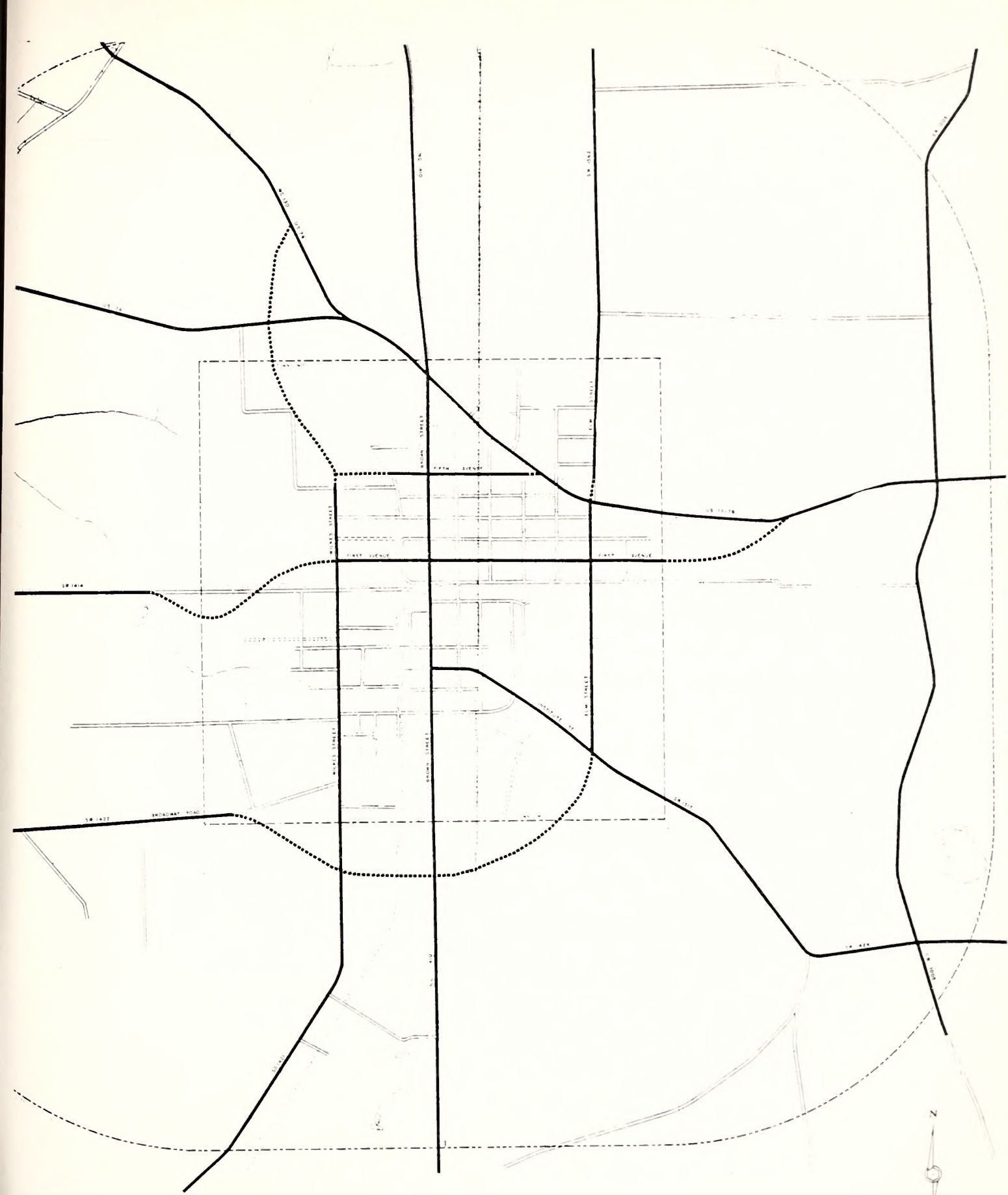
US 74-76, NC 130, NC 410, several radials and crosstowns comprise the Chadbourn major street system (see Figure 4). East-west movements through Chadbourn are accommodated by the US 74-76 Bypass and US 74-76, NC 130 Business. Virtually all north-south movement is along NC 410, which is heavily congested in the downtown area. Rail movements on the lines west and south of town are expected to increase with the introduction of new industry.

Existing Thoroughfare Plan

The 1966 thoroughfare plan (see Figure 5) was seen as a possible solution to Chadbourn's traffic problems. Railroad Avenue was proposed to be shifted to cross the railroad tracks and tie into First Avenue. First Avenue was to be extended to Strawberry Boulevard. Wilkes Street was proposed to be extended to US 74 and US 76, and extensions of Fifth Avenue (now SR 1574) were proposed as tie-ins to Wilkes Street and Strawberry Boulevard. Elm Street was proposed to be extended across Institute Street and to form a loop to the south by crossing NC 410, the railroad, and Wilkes Street and tying into Broadway Road (SR 1422). Also, the intersection of Elm Street at Strawberry Boulevard was to be realigned on the north side. First Avenue would then serve as a crosstown connector instead of a route for through traffic.

Since the adoption of the 1966 Thoroughfare Plan, a US 74-76 bypass has been constructed just north of Chadbourn within the planning area. As a result, east-west traffic through town has been reduced, thereby eliminating the need for routing through traffic along First Avenue. Thus the Railroad Avenue connector to First Avenue and the extension of First Avenue to Strawberry Boulevard should be eliminated. Instead, a connector from Railroad Avenue to Institute Street is proposed as a long-range project to provide an east-west route south of town. Another proposed change in the adopted thoroughfare plan is the realignment of Elm Street on the south side of Strawberry Boulevard instead of the north side. Due to the recent removal of a building on the south side, the new proposal will be less disruptive than a northern realignment. The only other change from the original plan is the designation of First Avenue and Fifth Avenue as minor thoroughfares instead of major thoroughfares since they serve as connectors rather than routes for through traffic.

Because significant increases in traffic volumes are projected for Brown Street (NC 410), where congestion is already a problem, it is proposed that Brown Street and Wilson Street become a one-way pair, with Brown Street carrying southbound traffic and Wilson Street northbound traffic.



THOROUGHFARE PLAN

ADOPTED BY CHADBOURN ON [illegible]

RECOMMENDED APPROVAL BY ADVANCE PLANNING DEPARTMENT ON JUNE 3, 1968

ADOPTED BY N.C. STATE HIGHWAY COMMISSION ON JULY 12, 1968

LEGEND

MAJOR THOROUGHFARES — EXISTING ALIGN ——— NEW ALIGN ------

FIGURE 5

MAJOR THOROUGHFARE PLAN

CHADBOURN, N. C.

JUNE 2, 1967

V. RECOMMENDATIONS

Figure 6 depicts the following thoroughfare system for Chadbourn:

Bypass System

1) US 74 from the north Planning Area Boundary (PAB) joining with US 76 and going to the east PAB. US 74 Business goes from the north PAB along NC 410 and then along Strawberry Boulevard to the east PAB.

2) US 76 from the west PAB joining with US 74 just west of the east PAB. US 76 Business turns southeast off the bypass at SR 1574 and runs along Strawberry Boulevard to the east PAB.

Radial System

The radial system consists of the following major thoroughfares:

1) Broadway Road (SR 1422) from the west Planning Area Boundary (PAB) to connect with the Elm Street extension.

2) Elm Street (SR 1562) from the north PAB south to Institute Street. The proposed extension to Broadway Road will serve as a southern loop connector. Widening to 36 feet is proposed from the bypass to Strawberry Boulevard and widening to 24' is proposed for the rest of existing Elm Street. Paving will be necessary from the railroad to Institute Street.

3) Institute Street (SR 1317) from the southeast PAB across NC 410 to connect with Railroad Avenue. The connector is a long range proposal.

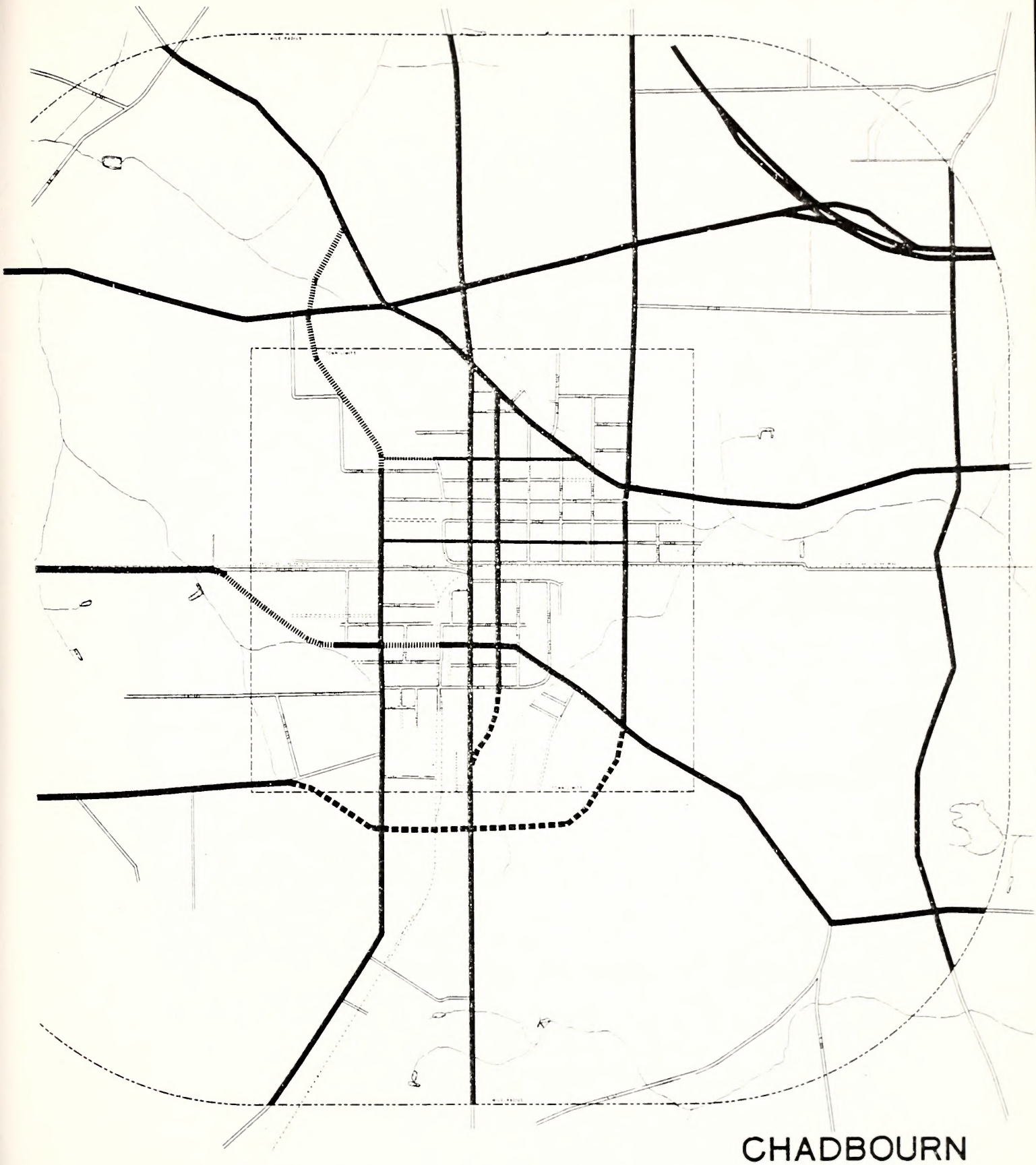
4) NC 130 from the north PAB along NC 410 to Strawberry Boulevard and over to the east PAB.

5) NC 410 from the north PAB to Strawberry Boulevard and from the south PAB to the Brown-Wilson Street one-way pair. Widening to 36 feet is proposed from the one-way pair connector to the Elm Street extension.

6) Railroad Avenue (SR 1414) from the west PAB to connect with Institute Street.

7) SR 1429 from the east PAB to Institute Street.

8) SR 1574 from the north PAB to US 76.



LEGEND

	EXISTING	PROPOSED	LONG RANGE
MAJOR THOROUGHFARES	▬▬▬	▬ ▬ ▬	▮▮▮▮▮
MINOR THOROUGHFARES	———	- - - -	———

THOROUGHFARE PLAN

FIGURE 6

CHADBOURN

NORTH CAROLINA

MAY 28, 1980

9) Wilkes Street (SR 1421 and SR 1422) from the south PAB across Railroad Avenue to Chappin Street. Long range proposals include the extension of Wilkes Street to US 76, and SR 1574 widening from Railroad Avenue to Fifth Avenue, paving from Broadway Road southward, and a grade separation at the railroad crossing.

Crosstowns

1) Brown Street-Wilson Street one-way pair from Strawberry Boulevard to just south of Smith Street. In order for these streets to function as one-way pair, construction of a connector between Wilson Street and Brown Street south of Smith Street will be necessary. Traffic signals will need to be installed at the intersection of Wilson Street and Strawberry Boulevard to accommodate the left turns from Wilson Street onto Strawberry Boulevard. The intersection of Brown Street and Strawberry Boulevard will require resignalization and parking on Brown Street from Railroad Avenue (SR 1425) to Strawberry Boulevard should be limited to the west side.

Design Requirements

Design requirements for thoroughfares vary according to the desired capacity and level of services to be provided. Universal standards in the design of thoroughfares are not practical. Each street section must be individually analyzed and its design requirements determined on the basis of amount and type of projected traffic, existing capacity, desired level of services, and available right-of-way.

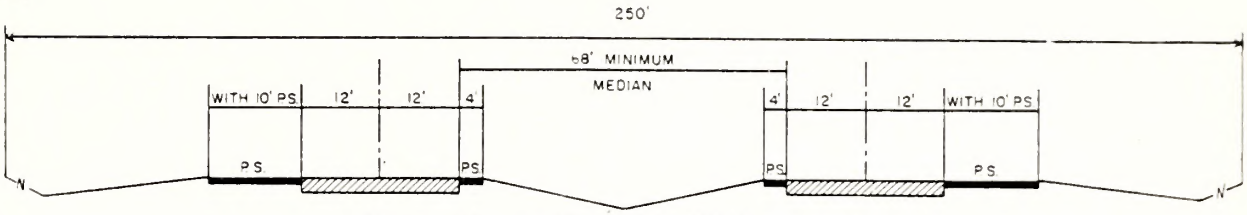
Typical cross section recommendations are shown in Figure 7. Cross section "A" is typical for controlled access freeways. The 68 foot grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

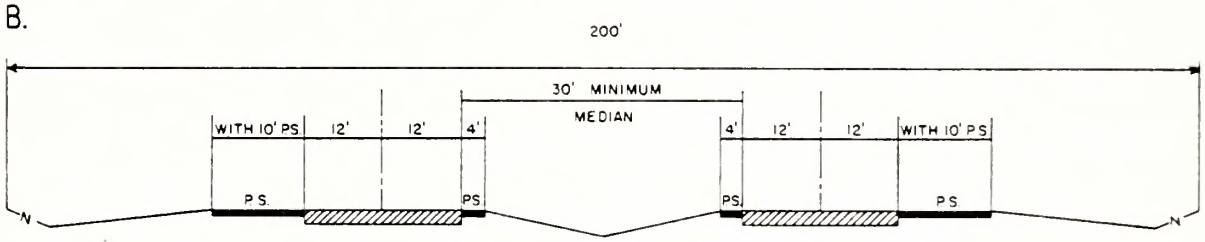
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



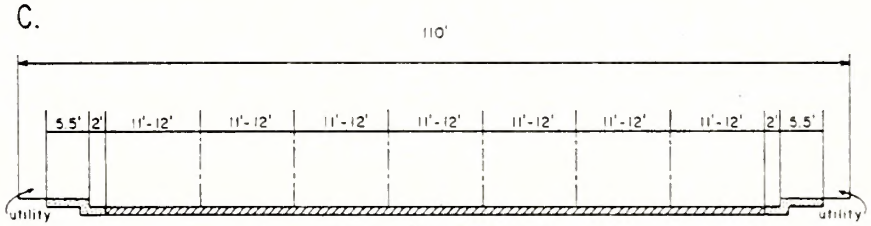
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



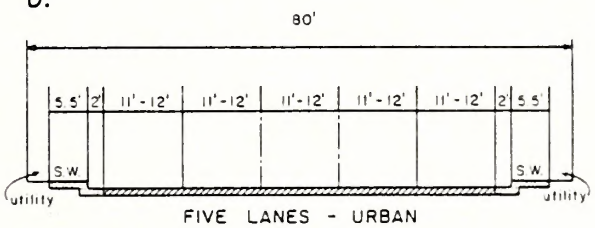
FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



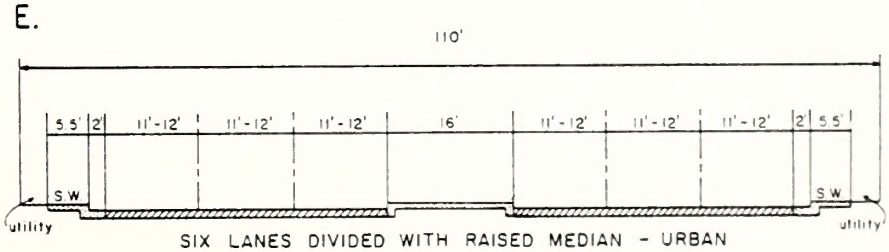
SEVEN LANES - URBAN

D.



FIVE LANES - URBAN

E.

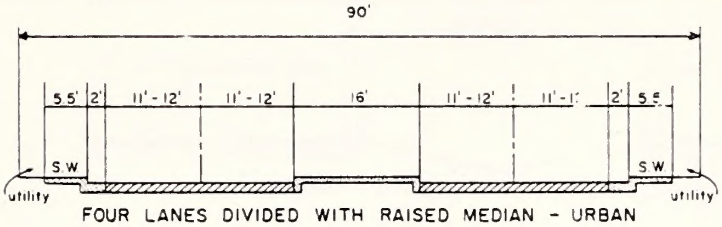


SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN

FIGURE 7

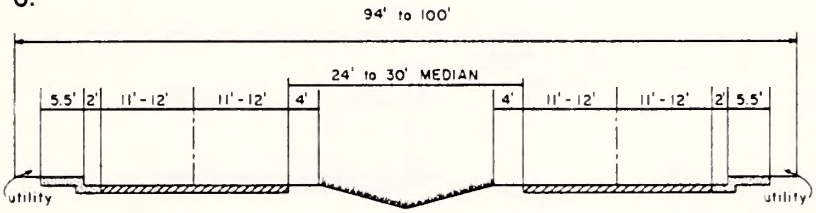
TYPICAL THOROUGHFARE CROSS SECTIONS
(CONTINUED)

F.



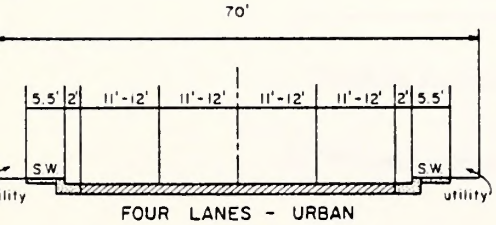
FOUR LANES DIVIDED WITH RAISED MEDIAN - URBAN

G.



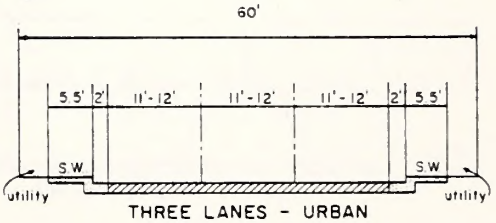
FOUR LANES DIVIDED - URBAN BOULEVARD
GRASS MEDIAN

H.



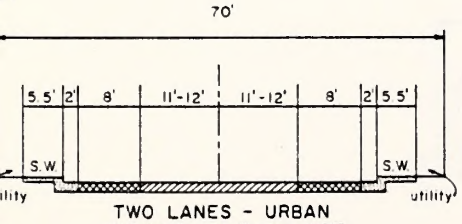
FOUR LANES - URBAN

I.



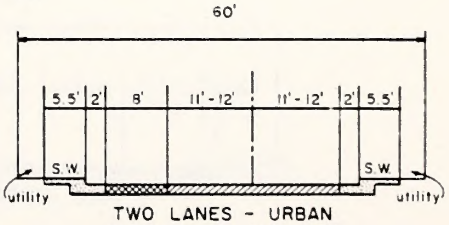
THREE LANES - URBAN

J.



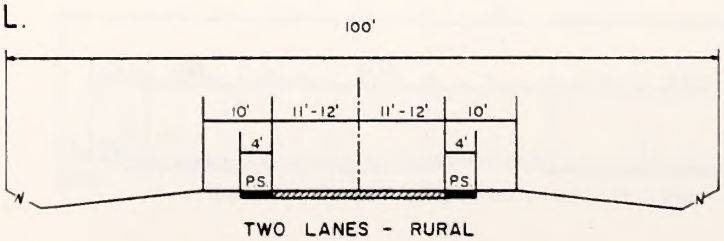
TWO LANES - URBAN
PARKING ON EACH SIDE

K.



TWO LANES - URBAN
PARKING ON ONE SIDE

L.



TWO LANES - RURAL

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes, but is not excessively high; left turning movements are light; and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically use cross section "I". Cross section "J" and "K" are usually recommended for minor throughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor throughfares where parking on both sides is needed as a result of more intense development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

The curb and gutter urban cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk further away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

Right-of-ways shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The

North Carolina Bicycle Facility and Program Handbook[2] should be consulted for design standards for bicycle facilities.

Recommended cross sections for Chadbourn Thoroughfares are listed in Appendix A.

Recommended design standards relating to maximum and minimum grades, minimum sight distances, maximum degree of curve and related superelevation, and other considerations for thoroughfares are given in Appendix B. This Appendix gives definitions and design standards recommended for inclusion in subdivision regulations.

Construction Priorities

The recommended Chadbourn Thoroughfare Plan includes the following proposed construction projects shown below with their respective priority groupings:

Project	Type of Construction
Priority 1 (1980-1990)	
1) Brown Street-Wilson Street one-way pair connector at south end	connector
2) Elm Street - extension to NC 410	extension, paving, and widening
Priority 2 (1990-2000)	
1) Elm Street - extension from NC 410 to SR 1422	extension
Long Range	
1) Wilkes Street extension to US 76	extension, paving, widening
2) Fifth Avenue	connectors
3) Institute Street from NC 410 to Railroad Avenue	extension

[2]The North Carolina Bicycle Facility and Program Handbook, Barton-Aschman Associates, Inc., April, 1975.

VI. IMPLEMENTATION

There are several tools which are available for implementation of the thoroughfare plan. These tools are described in this chapter.

State-Municipal Adoption of the Thoroughfare Plan

Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina provides that after development of the thoroughfare plan, the plan may be adopted by the governing body of the municipality and the Board of Transportation as the basis for future street and highway improvements. If mutually adopted, negotiations will begin to determine which of the existing and proposed thoroughfares will be a state responsibility and which will be a municipal responsibility. The municipality will not be expected to construct or maintain facilities which are designated a state responsibility; however, the municipality will share in the right of way costs with the municipality's share of the cost to be determined at time of construction.

A preliminary thoroughfare plan for Chadbourn was previously mutually adopted in 1966. Until such time as a revised plan is approved by the Town and the North Carolina Department of Transportation the 1966 plan remains in effect.

Subdivision Control

A subdivision ordinance requires that every subdivider submit to the Town Planning Board a plot of his proposed subdivision. Certain standards must be met by the developer before he can be issued a building permit to construct his development. Through this process it is possible to reserve or protect the necessary rights of way for projected streets which are a part of the thoroughfare plan and to require street construction in accordance with the plan. The Wilkes Street extension could be constructed in this way. Recommended standards and definitions for a subdivision ordinance are included in Appendix B. It is recommended that the Chadbourn Ordinance be reviewed with respect to the recommendations in this appendix.

Zoning

A zoning ordinance can be beneficial to thoroughfare planning in that planned location of various land uses and planned densities of dwelling units can be realized. This

provides a degree of stability on which to make future traffic projections and to plan streets and highways.

Other benefits of a good zoning ordinance are: (1) the establishment of standards of development which will aid traffic operations on major thoroughfares; (2) the minimization of strip commercial development which creates traffic friction and increases the traffic accident potential; and (3) the requirement for provision of off-street parking by new developers with the purpose of eventually prohibiting all curb parking on major thoroughfares.

Zoning ordinances should be enacted to control strip development along the major traffic carrying thoroughfares. Consideration should be given to help control future strip developments along Strawberry Boulevard.

Official Street Map

A municipality may, through special enabling legislation, adopt an official street map which indicates both existing and future street lines. No new construction or reconstruction of structures would be permitted within the designated future street lines. Over a period of time, this would reduce the cost of additional right of way along densely developed thoroughfares which will require widening at some time. An enactment of an official street map would benefit the Institute Street extension, the Fifth Avenue connector, and Wilson Street.

Urban Renewal

Urban renewal is the term used to describe the removal of blight in cities. It is one of the few tools available for correcting basic mistakes in the existing pattern.

The urban renewal program is carried out under the framework of the Federal Housing Act of 1954, as amended, and consists of a three-fold attact on blight. It calls for the conservation of good areas of the cities, rehabilitation of declining areas and for the clearance of slum areas so that they may be redeveloped to good standards. If a municipality meets certain requirements as to a master plan, good codes and ordinances, and citizen participation, it may obtain assistance in such a program from the Federal Government with the Government paying three-fourths of the cost of the project.

Capital Improvements Program

One of the tools which makes it easier to build a planned thoroughfare system is a capital improvements program. This is a long-range plan for the spending of money on street improvements, acquisition of rights of way, and other capital improvements within the bounds of projected revenues. Municipal funds should be available for construction of street improvements which are a municipal responsibility, right of way cost sharing on facilities designated a state responsibility, and advance purchase of right of way where such action is warranted.

TLW/MRP/LRG/CAC/dk

APPENDICES

APPENDIX A

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X-SECTION DIST MI	RDWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	ADTS	RECOMMENDED X-SECTION ADTS	RDWAY (ULT)	ROW (ULT)
BROADWAY ROAD (SR 1422)								
EAST PAB-ELM ST EXTENSION	.72	18	NA	5840	580		(L)	(100)
BROWN STREET								
WILSON CONNECTOR-SMITH ST	.20	20	100	(12000)			(I)	ADQ
SMITH STREET-SR 1425	.40	34	100	(12000)	7400			
SR 1425-SECOND AVENUE	.14	30	100	(12000)				
SECOND AVENUE-STRAWBERRY BOULEVARD	.50	34	100	(12000)	5200			
ELM STREET								
NORTH PAB-US 76 BYPASS	.66	18	65	(8340)			(L)	ADQ
US 76-STRAWBERRY BOULEVARD	.77	18	65	(10670)	1000		K	ADQ
STRAWBERRY BOULEVARD-RAILROAD AVENUE	.18	NA	NA	(10670)			(K)	(60)
RAILROAD AVE-INSTITUTE ST	.58	NA	NA	(10670)			L	100
INSTITUTE ST-NC 410	.66			(8340)			L	100
NC 410-BROADWAY ROAD	.66			(8340)			L	100
FIFTH AVENUE								
WILKES ST-COLONY ST	.17						(K)	(60)
COLONY STREET-PINE STREET	.40	18	NA				(K)	(60)
PINE ST-STRAWBERRY BLVD	.05						(K)	(60)
FIRST AVENUE								
WILKES STREET-ELM STREET	.77	18	NA				(K)	(60)
INSTITUTE STREET (SR 1317)								
SR 1429-ELM STREET	.90	18	NA				(L)	(100)
ELM STREET-BROWN STREET	.56	18	NA	1230			(K)	(60)
BROWN STREET-CLARK STREET	.10	18	NA				(K)	(60)
CLARK STREET-WILKES STREET	.18						(K)	(60)
WILKES ST-ENTERPRISE ST	.15	18	NA				(K)	(60)
ENTERPRISE ST-RAILROAD AVE	.50						(K)	(60)
NC 130								
ON US 74 BUSINESS	2.82							
NC 410								
SOUTH PAB-WILSON CONNECTOR	1.03	20	100	6850			(D)	ADQ
ON BROWN AND WILSON ST	1.04							
ON US 74 BUSINESS	1.00							
RAILROAD AVENUE (SR 1414)								

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X-SECTION DIST MI	RDWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	ADTS	ADTS	RECOMMENDED X-SECTION RDWAY (ULT)	ROW (ULT)
WEST PAB-INSTITUTE STREET EXTENSION	.51	20	60	6580	1600		(L)	ADQ
SR 1005								
SOUTH PAB-SR 1560	2.75	18	NA	5840			(L)	(100)
SR 1560-NORTH PAB	.89	24	NA	8340				
SR 1429								
EAST PAB-SR 1317	.65	18	NA	5840			(L)	(100)
SR 1574								
NORTH PAB-US 76	1.12	18	NA	5840			(L)	(100)
US 76-CITY LIMITS	.20	22	NA	7160				
CITY LIMITS-NC 410-130	.06	48	NA	18000				
US 74 BYPASS								
NORTH PAB-US 74	.90	48	230	52000	2500			
US 76-EAST PAB	.40	48	340	52000				
US 74 BUSINESS								
NORTH PAB-US 76 BYPASS	.75	20	100	6580			(H)	(70)
US 76 BYPASS-BROWN ST	.25	20	100	6580	3600		(H)	ADQ
BROWN STREET-ELM STREET	.64	48	60	18000	3500			
ELM STREET-CITY LIMITS	.18	22	60	7160			(L)	ADQ
CITY LIMITS-EAST PAB	1.00	24	100	8340				
US 76 BYPASS								
WEST PAB-US 74	2.70	24	300	8340	2400			
ON US 74 TO EAST PAB	.40							
US 76 BUSINESS								
ON US 74 BUSINESS	2.82							
WILKES STREET								
SOUTH PAB-BROADWAY ROAD	1.20	18	NA	5840	230		(L)	(100)
BROADWAY RD-RAILROAD AVE	.60	36	NA	10670	1100			
RAILROAD AVE-CHAPPIN ST	.30	NA	NA				(K)	(60)
CHAPPIN ST-SR 1574	.85						(L)	(100)
WILSON STREET (NC 410)								
BROWN STREET-SMITH STREET	.20			12000			I	60
SMITH ST-STRAWBERRY BLVD	.95	22	NA	12000			(I)	(60)

APPENDIX B

RECOMMENDED DEFINITIONS AND DESIGN STANDARDS FOR SUBDIVISION ORDINANCES

DEFINITIONS:

I. Streets and Roads:

A. Rural Roads

1. Principal Arterial - A rural link in a network of continuous routes serving corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.

2. Minor Arterial - A rural link in a network joining cities and larger towns and providing intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through movement. This network would primarily serve traffic.

3. Major Collector - A road which serves major intracounty travel corridors and traffic generators and provides access to the Arterial system.

4. Minor Collector - A road which provides service to small local communities and links the locally important traffic generators with their rural hinterland.

5. Local Road - A local road serves primarily to provide access to adjacent land and for travel over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of Interstate, other freeway, expressway, or parkway links, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. Minor Thoroughfares - Minor thoroughfares are important streets in the city system and perform the function of collecting traffic from local access streets and carrying it to the Major Thoroughfare system. Minor thoroughfares may be used to supplement the Major Thoroughfare system by facilitating a minor through-traffic movement and may also serve abutting property.

3. Local Street - A local street is any link not on a higher-order urban system and serves primarily to provide direct access to abutting land and access to higher systems.

C. Specific Type Rural or Urban Streets

1. Freeway, expressway, or parkway - Divided multilane roadways designed to carry large volumes of traffic at relatively high speeds. A freeway is a divided highway providing for continuous flow of vehicles with no direct access to abutting property or streets and with access to selected crossroads provided via connecting ramps. An expressway is a divided highway with full or partial control of access and generally with grade separations at major intersections. A parkway is a highway for noncommercial traffic, with full or partial control of access, and usually located within a park or a ribbon of parklike development.

2. Residential Collector Street - A local access street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. Cul-de-sac - A short street having but one end open to traffic and the other end being permanently terminated and a vehicular turn around provided.

5. Frontage Road - A local street or road that is parallel to a full or partial access controlled facility and functions to provide access to adjacent land.

6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

C. Lot - A portion of a subdivision, or any other parcel of land, intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

1. Corner Lot - A lot abutting upon two streets at their intersection.

2. Double-Frontage Lot - A continuous (through) lot which is accessible from both of the parallel streets upon which it fronts.

3. Reverse-Frontage Lot - A continuous (through) lot which is accessible from only one of the parallel streets upon which it fronts.

III. Subdivision

A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.

B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, whether immediate or future, of sale or building development, and all divisions of land involving the dedication of a new street or a change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or recombination of portions of previously platted lots where the total number of lots is not increased and the resultant

lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than five acres where no street right-of way dedication is involved; (3) the public acquisition by purchase of strips of land for the widening or opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. Since a transfer of property is involved, the dedication is made by written instrument and is completed with an acceptance.

D. Reservation - A reservation of land does not involve any transfer of property rights. It simply constitutes an obligation to keep property free from development for a stated period of time.

Design Standards

I. Streets and Roads:

The design of all streets and roads within Chadbourn shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHO) manuals.

The provision of street rights-of-way shall conform and meet the requirements of the thoroughfare plan for Chadbourn as approved by the Planning and Research Branch and adopted by the Town of Chadbourn and the North Carolina Board of Transportation.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

The urban planning area shall consist of that area within the urban planning boundary as depicted on the mutually adopted Chadbourn Thoroughfare Plan.

The rural planning area shall be that area outside the urban planning boundary.

A. Right-of-Way Widths: Right-of-way widths shall not be less than the following and shall apply except in those cases where right-of-way requirements have been specifically set out in the Chadbourn Thoroughfare Plan.

	Min. Right of Way, Ft.
1. Rural	
a. Principal Arterial	
Freeways	350
Other	200
b. Minor Arterial	100
c. Major Collector	100
d. Minor Collector	100
e. Local Road	*60

*The desirable minimum right-of-way is 60 feet. If curb and gutter is provided, 50 feet of right-of-way is adequate on local residential streets.

		Min. Right of Way, Ft.
2.	Urban	
a.	Major Thoroughfare Other than Freeway and Expressway	90
b.	Minor Thoroughfare	70
c.	Local Street	*60
d.	Cul-de-sac	**Variable

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. In all cases in which right-of-way is sought for an access controlled facility, the subdivider will only be required to make a reservation.

A partial width right-of-way, not less than sixty (60) feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

B. Street Widths: Widths for street and road classifications other than local shall be as required by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

a. Local Residential
   Curb and gutter section - 26 feet, to face of curb
   Shoulder section - 20 feet to edge of pavement, 4 foot shoulders

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*The desirable minimum right-of-way is established as 60 feet. If curb and gutter is provided, 50 feet of right-of-way is adequate.

**The right-of-way dimension will depend on radius used for vehicular turn-around. Distance from edge of pavement of turn around to right-of-way should not be less than distance from edge of pavement to right-of-way on street approaching turn-around.

b. Residential Collector
Curb and gutter section - 34 feet, face to face of curb
Shoulder Section - 20 feet to edge of pavement, 6 foot shoulders

C. Geometric Characteristics: The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. Design Speed

The design speeds for subdivisions type streets shall be:

	Desirable	(Minimum) Level	Rolling	Mountainous
Rural				
Minor Collector Roads	60	(50)	(40)	(30)
Local Roads including Residential Collectors and Local Residential	50	(50)*	(40)*	(30)*
Urban				
Major Thoroughfares Other than Freeway or Expressway	60	(50)	(50)	(50)
Minor Thoroughfares	60	(50)	(40)	(40)
Local Streets	40	(40)**	(30)**	(20)**

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*Based on projected annual average daily traffic of 400-750. In cases where road will serve a very limited area and small number of dwelling units, minimum design speeds can be reduced further.

**Based on projected annual average daily traffic of 50-250.

2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

Design Speed	Level	Rolling	Mountainous
60	3	4	6
50	4	5	7
40	5	6	8
30		9	10
20			12

b. A minimum grade for curbed streets normally should not be less than 0.5%, a grade of 0.35% may be allowed where there is a high type pavement accurately crowned and in areas where special drainage conditions may control.

c. Grades for 100 feet each way from intersections should not exceed 5%.

d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long, may be 150% greater.

3. Minimum Sight Distances

In the interest of public safety, no less than the minimum sight distance applicable shall be provided in every instance. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters. (General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case):

DESIGN SPEED, MPH		20	30	40	50	60
Stopping Sight Distance -						
i.	Min. Stopping Distance, Ft.	150	200	275	350	475
	Des. Stopping Distance, Ft.	150	200	300	450	650
ii.	Min. K* Value For:					
a.	Min. Crest Vert. Curve	16	28	55	85	160
	Des. Crest Vert. Curve	16	28	65	145	300
b.	Min. Sag Vert. Curve	24	35	55	75	105
	Des. Sag Vert. Curve	24	35	60	100	155
Passing Sight Distance -						
i.	Min. Passing Distance, Feet (2 lane)		1100	1500	1800	2100
ii.	Min. K* Value For Crest Vertical Curve		365	686	985	1340

Sight distance provided for stopped vehicles at intersections should be in accordance with, "A Policy on Geometric Design of Rural Highways".

4. The following table shows the maximum degree of curve and related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is .08. The maximum rate of superelevation for urban streets with curb and gutter is .06 with .04 being desirable.

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*K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide minimum sight distance.

Design Speed MPH	Maximum e*	Minimum Radius (Rounded) Feet	Maximum Degree of Curve (Rounded) Degrees
20	.04	125	45.0
30	.04	300	19.0
40	.04	560	10.0
50	.04	925	6.0
60	.04	1410	4.0
20	.06	115	50.0
30	.06	275	21.0
40	.06	510	11.5
50	.06	830	7.0
60	.06	1260	4.5
20	.08	110	53.5
30	.08	250	23.0
40	.08	460	12.5
50	.08	760	7.5
60	.08	1140	5.0

*e = rate of roadway superelevation, foot per foot

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty (60) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Off-set intersections are to be avoided unless exception is granted by the Divison of Highways. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

E. Cul-de-sacs

Cul-de-sacs, unless exception is granted by the local planning board, shall not be more than five hundred (500) feet in length. The distance from the edge of pavement on the vehicular turn-around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn-around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is made for service access.

   Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least twenty (20) feet.

3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn-around facilities at the dead-end as may be approved by the Planning Board.

4. Sharp changes in alignment and grade shall be avoided.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the nearest District Engineer of the Divison of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

I. Wheel Chair Ramps

In accordance with Chapter 136, Article 2A, §136-44.14, all street curbs in North Carolina being constructed or re-constructed for maintenance procedures, traffic operations, repairs, correction of utilities, or altered for any reason after September 1, 1973, shall provide wheelchair ramps for the physically handicapped at all intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Wheelchair ramps and depressed curbs shall be constructed in accordance with details contained in the Department of Transportation, Divison of Highways, Publication entitled, "Guidelines, Curb Cuts and Ramps for Handicapped Persons".

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and re-constructed bridges serving 2 lane, 2-way traffic should be as follows:

   a. Shoulder Section Approach

      i. Under 800 ADT Design Year
      Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.

      ii. 800-200 ADT Design Year
      Minimum 34 feet width face to face of parapets or rails or pavement width plus 12 feet, whichever is greater.

      iii. Over 2000 ADT Design Year
      Minimum 40 feet
      Desirable 44 feet width face to face of parapets or rails.

   b. Curbs and Gutter Approach

      i. Under 800 ADT Design Year
      Minimum 24 feet face to face of curbs.

      ii. Over 800 ADT Design Year
      Width of approach pavement measured face to face of curbs.

   Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the

curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'-6" minimum, or greater if sidewalks are required.

2. The clear roadway widths for new and re-constructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

   a. Shoulder Section Approach -
      Width of approach pavement plus width of usable shoulders on the approach left and right.
      Min. 8'
      Des. 10'
   b. Curb and Gutter Approach - Width of approach pavement measured face to face of curbs.

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